TESTING APPARATUS FOR LIGHT- AND WEATHER-RESISTING PROPERTIES

DESCRIPTION OF THE PRIOR ART

Organic material and auxiliary means, as e.g. textiles, rubber, leather, artificial material, lacquers and coloring matters will change their properties as well as their morphological structure under the influence of sunlight and other climatic factors, as there are temperature, humidity and rain. As a result of these molecular processes, there will be change of the macroscopic, mechanic, thermic, electric and optical properties, as for example, mechanic stability, heat conductibility, electric conductibility, as well as the electricity constant, transmission and the color of the material. The synthetic coloring matters, which in the first phase of their development have still been rather instable to the sunlight, necessitated a test for light- and weather-resisting properties of the colorations. The tests whereby the material was exposed to the influence of sunlight, and climatic conditions have already many times been replaced by a simulation of the sunlight or, respectively, the climatic conditions.

The conventional devices developed for a simulated testing of the light-and weather-resisting properties of materials have a centrally arranged radiator, being a gas discharge radiator in the more modern devices and centrally arranged in the sample room proper, whereby the samples are arranged around this radiator either standing or suspended. Concerning their outer dimensions, these devices are configured extremely voluminous and clumsy. In addition thereto, the radiation reflectors or, respectively, the initially mentioned selectively reflecting mirrors necessitate a relatively complicated construction. Further, with these devices, where the samples are arranged around die radiation source, the infrared radiation must be eliminated via an absorber, which has to be cooled off by a cooling agent. Thus these devices can only be manufactured at a considerable expense or cost. Moreover, the accessability of the sample room is obstructed, the more so as the sample room must be closed in view of the different climatic conditions that must be strictly adhered to, and thus one must either provide for very many doors or, in the event the samples are rotable around the central radiation source, they must be individually rotated to face one specific door. In this respect the replacement of the samples exacts a considerable expenditure, which could be avoided if such an arrangement of the samples were not absolutely necessary.

An apparatus for producing artificial climatic conditions has already become known (U.S. Pat. No. 1,827,530), in which the substrates to be treated are placed on an essentially horizontal table and then irradiated by quartz lamps, for example. Thereby the desired climatic conditions are simulated by means of rather expensive equipment.

OBJECTS OF THE INVENTION

It is the object of the invention to provide a testing apparatus for light- and weather-resisting properties of the initially mentioned kind, which is simple with respect to construction and of little extent concerning its outer dimensions, which at the same time permits an effective and exact light- and weather-resisting test under favorable conditions, which simultaneously produces variable climatic conditions, and which provides an easy access to the interior of the apparatus.

SUMMARY OF THE INVENTION

According to the invention, this object is realized in that samples in a manner already known as such are placed on an essentially horizontal support, and that the sample room above this support consists of an elongated reflector channel of parabolic section, sealed at its extremities by faces of parabolic circumference, whereby the lateral faces of the reflector channel, being parabolic in assembled condition, are made of elastic pliable sheet metal, which adopts the parabolic shape when applied to the parabolic circumference of the front faces.

Due to the special configuration of the side wall of the reflector channel that can be connected with a door, and the plain arrangement of the sample support, an advantageous and easy access is obtained with regard to a quick replacement of the samples. In that the side wall of the reflector channel consists of a simple elastic sheet metal not premolded, contrary to such reflectors known so far, there will be no more molding costs. Thus for the manufacture of a parabolic reflector channel, all that is left is a simple plate part treatment. In addition thereto, individual reflector parts can be easily exchanged if they have become dull during operation, so that it is no longer necessary to replace the entire reflector, a rather complicated work by the way. As a simple punched part, the front faces of the reflector channel present a parabolic circumference, against which rest the side faces of the reflector channel, without having to be premolded as mentioned above. Since the side wall of the reflector channel is made of elastic sheet metal, it can deform itself if the pivot of the door is not in the fixation point of the upper edge of the side wall, and again rest against the parabolic circumference of the front face in an advantageous manner if the door is closed again.

Thereby the pivot of the elastic side wall of the reflector channel and that of the door can be locally separated from each other, whereby the lower edge of the side wall is movably carried in the door. Thus in an especially easy manner one obtains a practical access and likewise providing sufficient space to the sample room.

In a preferred embodiment the gas discharge radiator, being a xenon radiator in order to simulate the sunlight as exactly as possible, is located in the focal line of the reflector channel of parabolic section. Thereby in an especially simple and efficient manner, the initially mentioned selectively reflecting mirrors can be arranged around the radiator, whereby the mirror selectively reflecting the infrared portion of the radiation, but permeable to the visible and ultraviolet portions, can be configured as a third of a tube curved away from the xenon radiator in the direction of the samples, and arranged between the upper edges of the side walls of the reflector. In a similar manner, the additional mirror, selectively reflecting the visible and ultraviolet portion of the radiation and permeable to the infrared portion thereof, can be arranged on the side of the xenon radiator not facing the samples in a rooflike manner, such as to lean tangentially against the imaginary elongation of the parabolic reflector. Thereby an optimum reflection of the ultraviolet rays or, respectively, of the visible radiation portion is obtained. By this arrangement, the infrared portion of the